

AMSAT News Service Weekly Bulletins

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AMSAT NEWS SERVICE

ANS-110

The AMSAT News Service bulletins are a free, weekly news and information service of AMSAT North America, The Radio Amateur Satellite Corporation. ANS publishes news related to Amateur Radio in Space including reports on the activities of a worldwide group of Amateur Radio operators who share an active interest in designing, building, launching and communicating through analog and digital Amateur Radio satellites.

The news feed on <http://www.amsat.org> publishes news of Amateur Radio in Space as soon as our volunteers can post it.

Please send any amateur satellite news or reports to:
ans-editor at amsat.org.

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ANS-110 AMSAT News Service Weekly Bulletins

AMSAT News Service Bulletin 110.01

From AMSAT HQ SILVER SPRING, MD.

April 20, 2014

To ALL RADIO AMATEURS

BID: \$ANS-110.01

Successful launch of KickSat carrying 104 Sprite satellites

Five CubeSats including KicksSat which carries 104 Sprite satellites on 437 MHz were successfully launched by the SpaceX CRS-3 mission on Friday, April 18 at 19:25:22 UT.

Zac Manchester KD2BHC says:

After a beautiful launch KickSat was deployed in low Earth orbit. We at Cornell and several amateur radio operators around the world have made contact with the spacecraft and it is alive and well. I can't thank all of you enough for your tremendous support over the past two years. Thank you for believing in KickSat!

This is the culmination of a lot of hard work and is a huge milestone, but we're not done yet. In 16 days the Sprites will deploy from KickSat. We need as many people as possible listening in, so if you're interested, please check out the wiki and our mailing list for more information. As always, don't hesitate to contact me with questions.

The CubeSats KickSat, SporeSat, TSAT, PhoneSat-v2.5 and ALL-STAR/THEIA were deployed into a 325x315 km 51.5 degree inclination orbit.

All the Sprites operate on a single frequency of 437.240 MHz and use Code Division Multiple Access (CDMA). The transmitter runs 10 mW output of Minimum Shift Keying (MSK) modulated binary data with each data bit modulated as a 511 bit Pseudo-Random Number (PRN) sequence. The ITU emission designator is 50K0G1D.

The KickSat CubeSat has downlinks on 437.505 MHz and 2401-2436.2 MHz.

Wiki <https://github.com/zacination/kicksat/wiki>

KickSat mailing list <https://groups.google.com/forum/#!forum/kicksat-gs>

Kicksat Updates
<https://www.kickstarter.com/projects/zacination/kicksat-your-personal-spacecraft-in-space/posts>

PRN codes for KickSat Sprites released <http://amsat-uk.org/2014/03/23/prn-codes-for-kicksat-sprites-released/>

Preliminary TLE's are at http://mstl.atl.calpoly.edu/~ops/crs3_tle/

Frequencies of the other CubeSats can be found at
<http://www.cubesat.org/index.php/missions/upcoming-launches/139-crs3-launch-alert>

CRS-3 Payloads <http://www.spaceflight101.com/dragon-spx-3-cargo-overview.html>

Zarya
<http://www.zarya.info/Diaries/Launches/Launches.php?year=2014#022>

[ANS thanks AMSAT-UK for the above announcement]

Space-X Dragon Cargo Craft set to dock with ISS

A Dragon cargo craft stuffed with science and supplies is approaching the International Space Station for an automated laser-guided final approach Sunday, culminating with grapple by the outpost's robotic arm shortly after 7 a.m. EDT (1100 GMT).

The SpaceX-owned spaceship is carrying about 4,600 pounds of cargo to reinforce the space station's stocks of research experiments, crew provisions and spare parts.

Since launching Friday at 3:25 p.m. EDT (1925 GMT), the Dragon

spacecraft has fired its Draco thrusters to adjust its orbit to match that of the space station, setting up the final rendezvous sequence.

By about 2:30 a.m. EDT (0630 GMT), the Dragon spacecraft will be about 28 kilometers, or 17 miles, below and behind the space station. At that range, the Dragon should be within range of a UHF communications panel the space station's crew can use to issue simple commands to the supply ship in the event of a problem.

Several height-adjustment and midcourse correction rocket burns will fine-tune Dragon's rendezvous, guiding the ship into position 350 meters, or about 1,150 feet, directly beneath the space station at 5:13 a.m. EDT (0913 GMT).

The Dragon will initially rely on relative GPS navigation data to guide its approach to the space station. Once directly beneath the complex, its computers will switch to laser and thermal sensors.

Dragon carries a laser guidance sensor package and two thermal cameras to aid its final rendezvous with the space station.

Before leaving the initial hold point 1,150 feet beneath the space station, the cargo craft will conduct a 180-degree yaw maneuver to align its grapple fixture with the position of the space station's robot arm.

Soon after beginning its final approach sequence, the Dragon spacecraft will halt again at a hold position 250 meters, or 820 feet, below the space station. This brief hold allows ground controllers to assess the status of the rendezvous and issue a "go" for the Dragon to enter the so-called keep-out sphere, an imaginary circle around the space station in which traffic is tightly controlled for safety reasons.

The timeline calls for the Dragon spacecraft to depart the 250-meter hold point around 5:39 a.m. EDT (0939 GMT), pausing again at a 30-meter hold position before pressing on to a final point about 10 meters, or 33 feet, beneath the space station.

Arrival at the final hold point is scheduled around 6:56 a.m. EDT (1056 GMT).

Astronauts Koichi Wakata and Rick Mastracchio will monitor the final phase of the Dragon's approach, including manning the space station's robotic arm to grapple the free-flying cargo craft. Grapple is scheduled for 7:14 a.m. EDT (1114 GMT). Once the Dragon is firmly snared by the robotic arm, the 58-foot Canadarm will move the capsule into position for berthing with the Earth-facing port on the space station's Harmony module around 9:45 a.m. EDT (1345 GMT).

[ANS thanks Spaceflightnow.com for the above announcement]

KickSat Project Announces Telemetry Download Competition

Zac Manchester, KD2BHC, of the KickSat project is offering prizes to the first stations to copy telemetry from KickSat and the "Sprite" satellites it will deploy.

"I'll be offering prizes to the first several people who receive telemetry packets from KickSat as well as the first few who receive signals from the Sprites," the Cornell University aerospace engineering graduate student has announced. "The prizes will include souvenir Sprites, and CRS-3 and ELaN-V mission patches."

KickSat's Zac Manchester, KD2BHC, offers a whimsical boost to the delayed SpaceX launcher at Cape Canaveral.

The KickSat will go into space with the third SpaceX ISS resupply mission, which was delayed at least until April 18. If all goes according to plan, the 3U KickSat CubeSat subsequently will release more than 100 Sprite satellites -- each about the size of a small cracker -- into orbit. They will become the smallest Earth-orbiting satellites ever.

For KickSat telemetry (437.505 MHz and 2401-2436.2 MHz), Manchester wants the raw hex or ASCII packet data, "and I have to be able to successfully decode it." For the Sprites, he wants a raw baseband recording, "and I have to be able to decode at least one Sprite signal from it." All of the Sprites are on the same frequency -- 437.240 MHz. Manchester said he is the final judge on winners, and he'll continue to offer prizes, "until I run out of cool swag." To get in on the fun, Manchester said, visit the KickSat Wiki and sign up for the KickSat mailing list.

[ANS thanks the 4/17/2014 ARRL Letter for the above announcement]

Space-X supply ship begins journey to space station

SpaceX's commercial Dragon supply ship thundered into orbit Friday to begin a two-day pursuit of the International Space Station, setting up the delivery of 2.4 tons of fresh supplies and experimental cargo to the 450-ton research complex Sunday.

The Dragon spacecraft, flying on SpaceX's third operational resupply run to the space station, lifted off at 3:25:21 p.m. EDT (1925:21 GMT) from Cape Canaveral's Complex 40 launch pad, initially rising slowly as its Falcon 9 rocket powered up to more than 1 million pounds of thrust.

The launcher picked up speed, breaking the sound barrier about 70 seconds after liftoff and rocketing through the stratosphere before releasing its nine-engine first stage less than 3 minutes into the flight.

The first stage fell away, leaving the upper stage's single Merlin 1D engine to accelerate the rocket and Dragon payload into orbit as the vehicle flew northeast from Cape Canaveral, paralleling the U.S. East Coast to reach the space station's exact orbital inclination.

The 12-foot-diameter first stage was programmed to ignite its engines two times during its fall back into the Atlantic Ocean, slowing its velocity before deploying four landing legs made of carbon fiber and aluminum honeycomb.

Friday's launch was the first Falcon 9 rocket to fly with landing legs.

Elon Musk, SpaceX's CEO and chief designer, posted an update Friday night on Twitter saying the first stage made a good landing despite high waves in the recovery zone a few hundred miles northeast of Cape Canaveral.

"Data upload from tracking plane shows landing in Atlantic was good! Several boats enroute through heavy seas," Musk tweeted, adding a few minutes later that the first stage's flight computers continued transmitting for 8 seconds after reaching the water, an indication the rocket must have splashed down with minimal damage.

SpaceX says the experimental first stage recovery is a stepping stone toward reusing the Falcon 9 rocket, which Musk says is critical for reducing the cost of space transportation.

While the first stage's return maneuvers garnered much attention during a post-flight press conference Friday, the mission's primary goal is to resupply the space station, reinforcing the orbiting outpost's dwindling food inventory and delivering fresh experiments for researchers.

"I'm feeling pretty excited," Musk told reporters in a telephone call from SpaceX headquarters in Hawthorne, Calif. "This is a happy day. Most important of all is that we did a good job for NASA ... Everything else is secondary to that."

The mission is SpaceX's third resupply run to the space station, coming after successful flights in October 2012 and March 2013 to kick off the execution of a \$1.6 billion logistics contract with NASA. Signed in December 2008, the deal covers 12 missions for the delivery of a cumulative 44,000 pounds of cargo to the space station.

After reaching orbit Friday, the Dragon spaceship deployed from the Falcon 9's second stage about 10 minutes after liftoff, receding from the view of an on-board "rocketcam" backdropped by the muted blue colors of the ocean splashed against the stark blackness of space.

The spacecraft automatically unfurled two power-generating solar arrays with a wingspan of 54 feet.

SpaceX engineers initially ran into a problem with the Dragon spacecraft's propulsion system, causing the capsule to miss an appointed engine burn to set up for its two-day chase of the space station.

But Musk said the glitch, traced to an isolation valve, was bypassed by the use of a backup valve and the cargo mission was on track to reach the space station early Sunday.

Late Friday, the Dragon spacecraft opened its navigation bay door, exposing the ship's laser and thermal guidance sensors to be used in the final phase of its approach to the space station.

Controllers plan a series of orbit-raising burns over the next day-and-a-half, leading to the arrival of Dragon in the vicinity of the complex in the predawn hours Sunday, U.S. time.

The spaceship will approach the space station from below, eventually pausing about 30 feet beneath the complex while astronauts Koichi Wakata and Rick Mastracchio snare Dragon with a robotic arm.

Grapple is scheduled for 7:14 a.m. EDT (1114 GMT) to wrap up a 40-hour rendezvous that began with the Falcon 9 rocket's launch Friday.

The Dragon spacecraft launched Friday sports several upgrades over previous SpaceX cargo vehicles, nearly quadrupling the ship's capacity for powered cargo. The modifications include additional freezers for biological samples and redesigned cargo racks to accommodate additional payloads, according to SpaceX.

The mission is also taking up research experiments in the Dragon's unpressurized trunk for the first time. The passengers include a NASA optical communications terminal to demonstrate high data-rate links between the space station and the ground, along with a high-definition camera suite to collect videos of Earth.

The payload packages will be mounted outside the space station by the lab's Canadian-built robotics system.

Astronauts will manually remove items stowed inside the Dragon spacecraft's internal section, including 1,576 pounds of science and research gear, 1,049 pounds of crew provisions, 449 pounds of vehicle hardware, and 271 pounds of spacewalk tools.

The Dragon will arrive with a fresh spacesuit for the space station's six-person crew, a space age garden to demonstrate vegetable growth in microgravity, and legs for Robonaut 2, a humanoid robot launched on a 2011 space shuttle mission.

The space station will repack the Dragon spacecraft's pressurized module with experiment samples and other hardware destined to return to Earth. Dragon's departure and splashdown in the Pacific Ocean is scheduled for May 18.

[ANS thanks Steven Clark of Spaceflightnow.com for the above announcement]

The STELAR Project 2014

The education and science charity STELAR has been active in promoting radiocommunications in schools and colleges for over 20 years, as part of curriculum enrichment and personal and professional development for teachers.

Through its specialist courses, it has achieved much notable success in establishing radio clubs in schools and inspiring young people to seek careers in science, electronics and industry. It has played a major role in space and satellite communications in schools.

In 2013 it provided opportunities for satellite experiment by offering SDR receivers to schools allowing them to participate in the current series of FUNCUBE satellite experiments.

Now in 2014 STELAR is offering a new challenge to educators both professional and Amateur. The phenomenal success of the Raspberry Pi computer has opened up new opportunities and stimulated demand for educational projects linking communications systems, via computers.

This year STELAR is seeking to support the very best of those ideas by making available grants to educational groups, with projects designed to stimulate experiments with radio linked computing.

Typically these might take the form of:

- Radio systems linked to but not exclusively, a Raspberry Pi, computer.
- A detailed Teachers guide to the use and benefits of FUNCUBE or similar satellite systems in schools,
- The creation of radio-science projects to aid teachers personal and professional development.

Educational groups can apply for funding to develop a project of their choice, by submitting ideas for consideration by June 30, 2014. Groups should set out their aims and giving as much detail as possible. Successful entries will be notified during the Autumn term.

Interested ? then make contact by visiting the STELAR website
<http://www.stelar.info/contact>

[ANS thanks AMSAT-UK for the above information]

KickSat launch postponed until Friday

The SpaceX CRS-3 Dragon launch of five CubeSats and 104 Sprite satellites has been postponed until Friday, April 18, 2014 at 1925 UT.

SpaceX were finally set to launch their Dragon spacecraft on its third Commercial Resupply Services mission to the ISS Monday, prior to a scrub being called over an hour ahead of lift-off. It is reported there was a helium leak on the first stage, the next launch opportunity is Friday.

The launch had been planned for December 2013 but has suffered a number of delays.

Read the full story at
<http://www.nasaspaceflight.com/2014/04/spacex-crs-3-dragon-new-milestones/>

KickSat information
<http://amsat-uk.org/2014/04/10/kicksat-sprites-radio-competition/>

Frequencies of the other CubeSats can be found at
<http://www.cubesat.org/index.php/missions/upcoming-launches/139-crs3-launch-alert>

[ANS thanks AMSAT-UK for the above information]

Video of ISS HamTV – Koichi Wakata KC5ZTA April 13, 2014

The final configuration of the International Space Station (ISS) HamVideo Digital TV system took place on Sunday, April 13 at 1823 UT. ISS commander Koichi Wakata KC5ZTA operated using the call sign OR4ISS.

Configuration 4 was used:

- * ARISS antenna 43
- * Frequency 2395 MHz
- * Symbol rate 2.0 MS/s

Ground stations G4KLB, F6DZP, IK1SLD and KI (Livorno) received the signals and streamed the video over the BATC server. The DATV signal was received for about 6 minutes.

Commander Wakata congratulated ARISS for this achievement and answered a series of questions, prepared in the manner of a school contact. He also proceeded to a microgravity experiment.

Congratulations to the Ham Video team for this outstanding performance.

Next step should be a video enhanced ARISS school contact. We will keep you informed on any progress.

The Ham Video transmitter has downlink frequencies of 2.369, 2.395, 2.422 and 2.437 GHz in a DVB-S type format (symbol rates of 1.3 Ms/s and 2.0 Ms/s). The two patch antennas, ARISS 41 and ARISS 43, are located on the nadir of the Columbus module. The Ham Video transmitter puts out approximately 10 W EIRP. The camera is a Canon XF-305.

Report by Jean Pierre F6DZP about his reception of HamTV on April 13, 2014

<http://www.vivadatv.org/viewtopic.php?f=66&t=317>

Read the HamTV overview by Gaston Bertels ON4WF

<http://tinyurl.com/HamTVoverview>

Join the ISS HamTV Yahoo Group <http://groups.yahoo.com/group/HamTV>

Webstream of the TV transmissions http://batc.tv/ch_live.php?ch=4

ARISS-EU HamTV Bulletins <http://www.ariss-eu.org/>

HamTV on Facebook <https://www.facebook.com/Hamtvproject>

[ANS thanks Gaston Bertels, ON4WF, ARISS EU Chair, the ARRL, and AMSAT-UK for the above information]

Upcoming AMSAT Events

Information about AMSAT activities at other important events around the country. Examples of these events are radio club meetings where AMSAT Area Coordinators give presentations, demonstrations of working amateur satellites, and hamfests with an AMSAT presence (a table with AMSAT literature and merchandise, sometimes also with presentations, forums, and/or demonstrations).

Monday, 28 April 2014 – presentation at Franklin County Amateur Radio Club meeting in Greenfield MA by Barry Baines WD4ASW (AMSAT President)

Saturday, 3 May 2014 – Cochise Amateur Radio Association's Larry

Warren Hamfest in Sierra Vista AZ (southeast of Tucson) – AMSAT will have a table at this hamfest, and satellite demonstrations are planned.

Saturday, 7 June 2014 – Kachina Amateur Radio Club's White Mountain Hamfest in Show Low AZ (eastern Arizona, south of US-60/AZ-77/AZ-260) – AMSAT will have a table at this hamfest, and satellite demonstrations are planned.

Friday and Saturday, 13-14 June 2014 – Ham-Com in Plano TX (north of Dallas)

Thursday through Sunday, 17-20 July 2014 – ARRL Centennial Convention in Hartford CT. AMSAT will host a day-long Satellite Workshop on Thursday, and have a booth at the convention along with an AMSAT Forum and demonstrations throughout the convention.

Saturday and Sunday, 30-31 August 2014 – Shelby Hamfest in Shelby NC (west of Gastonia and Charlotte) – Barry Baines WD4ASW (AMSAT President) will host an AMSAT Forum on Saturday of this weekend

Friday through Sunday, 12-14 September 2014 – ARRL Southwestern Division Convention 2014 in San Diego CA (north of the city center, near Montgomery Field airport & I-805/CA-163 interchange) – AMSAT will have a booth at this convention, there will be on-air demonstrations using satellites throughout the convention, and a presentation on amateur satellites and AMSAT

AMSAT maintains and updated list of known upcoming events at http://ww2.amsat.org/?page_id=218

[ANS thanks AMSAT-NA for the above announcement]

ARISS News

Next planned event(s): Dixon Elementary School, Holly Ridge, NC

A direct contact with students at Dixon Elementary School, Holly Ridge, NC, via NC40C is a go for Mon 2014-04-21 18:05:53 UTC 41 deg. Watch for possible last minute schedule change due to SpaceX operations.

Dixon Elementary School is located in a rural setting, with its feeder communities North Topsail Beach, Sneads Ferry, Holly Ridge and Surf City. Our community has seen sharp rises in the population of retirees and young families both military and civilian. With the deployment of large numbers of military personnel to Camp Lejeune, New River Air Station, and MARSOC (Marine Special Operations Center) at Stone Bay, the Dixon area continues to grow. Our school population as of February 2014 is over 900 students. Dixon Elementary is a Title I School with 38% of our students receiving free or reduced meal benefits. Our student population consists of 81% white students, .09% American Indian, .06% Hispanic, 9% Black, 2% Asian and .007% Pacific Islander.

Dixon Elementary was initially accredited by AdvancEd in 1978. Students are served by highly qualified teachers in 38 regular classrooms, three self-contained exceptional children's classrooms

and two pre-kindergarten classrooms. There are six highly qualified resource teachers who also offer support to our large population of exceptional children. Dixon Elementary is a charter member of the National Elementary Honor Society and the Global Schools Network.

In the fall of 2012 Dixon Elementary implemented a STEM classroom for instruction in science, technology, engineering and mathematics for students in grades K-5. Students rotate through the STEM classroom every 7 days. The STEM classroom teacher, a veteran science and math teacher, provides hands-on science and math instruction and project-based learning, including a variety of engineering projects. Each year Dixon Elementary hosts a SPACE DAY for students in Pre-K through 5th grade, with our community joining us in this spectacular event.

Students at Dixon Elementary students think strategically as they learn to play chess, participate in book studies, Scrabble Club, Robotics Club, Girls on the Run Club, Boys' Running Club, Academic Derby, Recycling Club (recently recognized by the National Council of Keep America Beautiful as the leading public school in recycling), Odyssey of the Mind (world competitors two out of the last three years), Science Fair competitors (Regional, State and National champions), and Science Olympiad.

ARISS is an international educational outreach program partnering the participating space agencies, NASA, Russian Space Agency, ESA, CNES, JAXA, and CSA, with the AMSAT and IARU organizations from participating countries.

ARISS offers an opportunity for students to experience the excitement of Amateur Radio by talking directly with crewmembers on-board the International Space Station. Teachers, parents and communities see, first hand, how Amateur Radio and crewmembers on ISS can energize youngsters' interest in science, technology, and learning. Further information on the ARISS program is available on the website

<http://www.ariss.org/>

(graciously hosted by the Radio Amateurs of Canada).

[ANS thanks ARISS for the above update]

Satellite Shorts from all over

CAMB-HAMS TO OPERATE GS3PYE/P FROM ISLE OF LEWIS

Thirteen members of Camb-Hams group will be operating GS3PYE/P from the Isle of Lewis from April 26th April to May 3rd. The Isle of Lewis is the northern part of Lewis and Harris and is the largest island of the Outer Hebrides of Scotland. Activity will be on 80 through 2 meters using all bands and modes. A pair of 2 meter to 70 centimeter and 2 meter to 23 centimeter station's will be dedicated to satellite contacts. 2 meter and 23 cm EME will be attempted using a low power portable station into yagi antennas with this part of the operation mainly focused on digital operation using modes developed by Joe Taylor, K1JT. In addition to the ham bands the group will be active on the major social networks before, during and after the trip. You can check on progress or interact with the operators via their blog at dx.camb-hams.com

[ANS thanks RSGB for the above announcement]

Portable Amateur Radio Satellite Antenna Video

Dave Tadlock KG0ZZ describes a home made small hand held portable amateur radio dual band 145 / 435 MHz satellite antenna in a new video

<http://amsat-uk.org/2014/04/19/portable-amateur-radio-satellite-antenna/>

[ANS thanks AMSAT-UK for the above announcement]

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In addition to regular membership, AMSAT offers membership in the President's Club. Members of the President's Club, as sustaining donors to AMSAT Project Funds, will be eligible to receive additional benefits. Application forms are available from the AMSAT Office.

Primary and secondary school students are eligible for membership at one-half the standard yearly rate. Post-secondary school students enrolled in at least half time status shall be eligible for the student rate for a maximum of 6 post-secondary years in this status. Contact Martha at the AMSAT Office for additional student membership information.

73,
This week's ANS Editor,
Joe Spier, K6WAO
k6wao at amsat dot org